Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application. Please amend the claims as follows:

1. (Currently Amended) A system for measuring fluid in a container, the system comprising:

one or more transducers operable to:

introduce a vibration to a container wall,

detect an introduced vibration that has propagated at least partially around a container wall in more than one vertical propagation direction, and

generate a signal representative of a detected vibration; and

a computer operable to determine a state of a fluid in a container based on a signal representing an introduced vibration that has propagated at least partially around a container wall in more than one vertical propagation direction.

2. (Original) The system of claim 1, wherein the one or more transducers comprises a first transducer, the first transducer operable to introduce a vibration to a container wall.

3. (Original) The system of claim 2, wherein the first transducer comprises an air transducer.

4. (Original) The system of claim 2, wherein the first transducer generates a vibration between approximately 30 kHz and 150 kHz.

5. (Original) The system of claim 1, wherein the one or more transducers are adapted to couple to the exterior of a container.

6. (Original) The system of claim 1, wherein a fluid state comprises a fluid level.

7. (Original) The system of claim 1, wherein the computer determines a fluid state in a container based on the time for an introduced vibration to propagate at least partially around a container wall to a detecting transducer.

8. (Original) The system of claim 1, wherein the computer determines a fluid state in a container based on the amplitude of an introduced vibration at detection.

9. (Original) The system of claim 1, wherein the computer determines a fluid state in a container based on:

the time for an introduced vibration to propagate at least partially around a container wall to a detecting transducer; and

the amplitude of the introduced vibration at detection.

10. (Original) The system of claim 1, wherein the computer is further operable to control an introducing transducer.

11. (Original) The system of claim 10, wherein the computer is operable to control the amplitude and frequency of vibrations introduced by the introducing transducer.

12. (Original) The system of claim 1, wherein the computer is further operable to determine a second fluid state.

13. (Original) The system of claim 1, further comprising a wireless communication device operable to send a wireless signal representing a generated signal to the computer.

14. (Currently Amended) A method for measuring fluid in a container, the method comprising:

introducing a vibration to a container wall;

detecting the vibration in the container wall after the vibration has propagated at least partially around the container wall in more than one vertical propagation direction; and

determining a state of a fluid in the container based on the detection of the vibration.

15. (Original) The method of claim 14, wherein determining a fluid state based on the detection of the vibration comprises determining the time for the vibration to propagate at least partially around the container wall to a detection point.

16. (Original) The method of claim 14, wherein determining a fluid state based on the detection of the vibration comprises determining the amplitude of the vibration at detection.

17. (Original) The method of claim 14, wherein determining a fluid state based on the detection of the vibration comprises:

determining the time for the vibration to propagate at least partially around the container wall to a detection point; and

determining the amplitude of the vibration at detection.

18. (Original) The method of claim 14, further comprising controlling the introduction of the vibration.

19. (Original) The method of claim 14, further comprising sending a wireless signal representing the detected vibration.

20. (Currently Amended) A system for measuring fluid in a container, the system comprising:

means for introducing a vibration to a container wall;

means for detecting an introduced vibration that has propagated at least partially around a container wall in more than one vertical propagation direction and for generating a signal representing a vibration at detection; and

means for determining a state of a fluid in a container based on a signal representing an introduced vibration that has propagated at least partially around a container wall.

21. (Original) The system of claim 20, wherein determining a fluid state comprises determining the time for an introduced vibration to propagate at least partially around a container wall to the detection means.

22. (Original) The system of claim 20, wherein determining a fluid state comprises determining the amplitude of an introduced vibration at detection.

23. (Original) The system of claim 20, wherein determining a fluid state comprises:

determining the time for an introduced vibration to propagate at least partially around a container wall to the detection means; and

determining the amplitude of the introduced vibration at detection.

24. (Original) The system of claim 20, wherein the determining means also controls the introducing means.

25. (Original) The system of claim 20, further comprising means for sending a wireless signal representing the generated signal to the determining means.

26. (Original) The system of claim 20, wherein the introducing means and the detecting means are adapted to couple to the exterior of a container.

27. (Currently Amended) A method for measuring fluid in a container, the method comprising:

receiving a signal representing a vibration detected after being introduced to and propagating at least partially around a container wall in more than one vertical propagation direction; and

determining a state of a fluid based on the signal.

28. (Original) The method of claim 27, wherein determining a fluid state based on the signal comprises determining the time for a represented vibration to propagate at least partially around a container wall to a detection point.

29. (Original) The system of claim 27, wherein determining a fluid state based on the signal comprises determining the amplitude of a represented vibration at detection.

30. (Original) The method of claim 27, wherein determining a fluid state based on the signal comprises:

determining the time for a represented vibration to propagate at least partially around a container wall to a detection point; and

determining the amplitude of the represented vibration at detection.

31. (Original) The method of claim 27, further comprising controlling the introduction of the represented vibration.

32. (Original) The method of claim 27, wherein receiving a signal comprises receiving a wireless signal representing the signal.

33. (Currently Amended) A system for measuring fluid in a container, the system comprising:

a computer operable to:

determine whether a signal representing a vibration detected after being introduced to and propagating at least partially around a container wall in more than one vertical propagation direction has been received, and

determine a state of a fluid based on the signal.

34. (Original) The system of claim 33, wherein determining a fluid state based on the signal comprises determining the time for a represented vibration to propagate at least partially around a container wall to a detection point.

35. (Original) The system of claim 33, wherein determining a fluid state based on the signal comprises determining the amplitude of a represented vibration at detection.

36. (Original) The system of claim 33, wherein determining a fluid state based on the signal comprises:

determining the time for a represented vibration to propagate at least partially around a container wall to a detection point; and

determining the amplitude of the represented vibration at detection.

37. (Original) The system of claim 33, wherein the computer is further operable to control the introduction of a vibration.

38. (Original) The system of claim 33, further comprising a wireless communication device operable to receive a wireless signal representing the signal.

39. (Currently Amended) An article comprising a machine-readable medium storing instructions operable to cause one or more machines to perform operations comprising:

determining whether a signal representing a vibration detected after being introduced to and propagating at least partially around a container wall in more than one vertical propagation direction has been received; and

determining a state of a fluid based on the signal.

40. (Original) The article of claim 39, wherein determining a fluid state based on the signal comprises determining the time for a represented vibration to propagate at least partially around a container wall to a detection point.

41. (Original) The article of claim 39, wherein determining a fluid state based on the signal comprises determining the amplitude of a represented vibration at detection.

42. (Original) The article of claim 39, wherein determining a fluid state based on the signal comprises:

determining the time for a represented vibration to propagate at least partially around a container wall to a detection point; and

determining the amplitude of the represented vibration at detection.

43. (Original) The article of claim 39, wherein the instructions are further operable to cause one or more machines to perform operations comprising controlling the introduction of a vibration.

44. (Original) The article of claim 39, wherein the instructions are further operable to cause one or more machines to perform operations comprising determining whether a wireless signal representing the signal has been received.

45. (Currently Amended) A system for measuring fluid in a container, the system comprising:

a container for holding a fluid, the container comprising a wall having an inner surface and an exterior surface;

a first transducer coupled to the exterior surface of the container wall near the top of the container, the first transducer operable to introduce a vibration to the container wall;

a second transducer coupled to the exterior surface of the container wall near the top of the container, the second transducer operable to detect the vibration after it has propagated at least partially around the container wall and to generate a signal representative of the vibration at detection;

a wireless communication device coupled to the second transducer, the wireless communication device operable to send a wireless signal representing the generated signal; and

a second wireless communication device, the second wireless communication device operable to receive the wireless signal;

a computer coupled to the second wireless communication device, the computer operable to:

determine if a signal representative of the vibration at detection has been received;

determine a fluid mass in the container based on the time for the vibration to propagate at least partially around the wall from the first transducer to the second transducer,

determine a fluid volume based on the fluid mass,

determine a fluid level based on the fluid volume, and

control the amplitude and frequency of the vibration introduced by the first transducer.

Please add the following new claims: --

46. (New) The system of claim 1, wherein:

the one or more transducers are further operable to detect an introduced vibration that has propagated at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction; and

the computer is further operable to determine a state of a fluid in a container based on a signal representing an introduced vibration that has propagated at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction.

47. (New) The method of claim 14, wherein detecting the vibration in the container wall after the vibration has propagated at least partially around the container wall in more than one vertical propagation direction comprises detecting the vibration after it has propagated at least a majority of the way around a circumference of the container wall.

48. (New) The system of claim 20, wherein:

the means for detecting an introduced vibration that has propagated at least partially around a container wall in more than one vertical propagation direction and for generating a signal representing a vibration at detection is further operable to detect an introduced vibration that has propagated at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction; and

the means for determining a state of a fluid in a container based on a signal representing an introduced vibration that has propagated at least partially around a container wall is further operable to determine a state of a fluid in a container based on a signal representing an introduced vibration that has propagated at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction.

49. (New) The method of claim 27, wherein receiving a signal representing a vibration detected after being introduced to and propagating at least partially around a container wall in more than one vertical propagation direction comprises receiving a signal representing a vibration detected after being introduced to and propagating at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction.

50. (New) The system of claim 33, wherein the computer is further operable to determine a state of a fluid in a container based on a signal representing a vibration detected after being introduced to and propagating at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction.

51. (New) The article of claim 39, wherein determining a state of a fluid based on the signal comprises determining a state of a fluid in a container based on a signal representing a vibration detected after being introduced to and propagating at least a majority of the way around a circumference of a container wall in more than one vertical propagation direction.

--.